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June 30, 2022

Via E-Mail

Katharine Kaplan  
U.S. Environmental Protection Agency  
ENERGY STAR Appliance Program

appliances@energystar.gov

Re: ENERGY STAR Program Requirements, Product Specification  
for Residential Dishwashers, Eligibility Criteria, Final Draft, Version 7.0

Dear Ms. Kaplan:

The Association of Home Appliance Manufacturers (AHAM), respectfully submits the following comments to the Environmental Protection Agency (EPA) regarding the ENERGY STAR Product Specification for Residential Dishwashers, Eligibility Criteria, Final Draft, Version 7.0.

AHAM continues to oppose EPA's proposed Version 7.0 specification. As explained in more detail below, the proposed specification will likely have negative effects on consumers, manufacturers, and the ENERGY STAR brand. Indeed, on that last point, proposed Version 7.0 threatens to undermine the ENERGY STAR program itself by driving designs that will associate the ENERGY STAR mark with poor value, poor performance, and lack of reliability due to qualification requirements that are ineffective and highly unreliable.

EPA would better direct its resources toward leveraging the incredibly efficient dishwashers the ENERGY STAR program has helped drive into the market by increasing the number of consumers that have access to those dishwashers and who use them in the most energy- and water-efficient way possible. The savings attributable to increasing dishwasher penetration and use (and reducing handwashing and pre-rinsing) dwarf those attributable to increases in product efficiency. And, unlike increases in product efficiency which will negatively impact consumers, the approach AHAM suggests can benefit consumers and save them real money on their water and energy bills.

EPA's proposed Version 7.0 specification, if finalized as proposed, threatens to harm consumers, manufacturers, and the ENERGY STAR brand for the following reasons:

1. **Minimal Energy Savings, No Lifetime Payback:** The Department of Energy (DOE) has done an analysis that finds that moving from ENERGY STAR Version 6.0 criteria to the proposed Version 7.0 criteria will save consumers only three dollars per year in energy

costs, but will add \$82 in cost for a new product.<sup>1</sup> That analysis shows that consumers will not recover that additional cost through savings on their energy and water bills during the lifetime of the dishwasher. Consumers should not have to bear this exceptional extra cost for minimal energy savings just to obtain a slightly more energy efficient dish washer than current models, particularly during this time of extraordinary inflation.

2. **Dishwasher Performance Affected:** ENERGY STAR, for the first time, is mandating a cleaning performance test for dishwashers. This test is extremely limited—it is not designed to comprehensively assess dishwasher performance. First, the test is limited as to what it measures related to cleaning: it does not measure grease and detergent build up, which are key cleanliness criteria for consumers. Second, the test does not address other elements of performance that matter to consumers: noise, cycle length, and drying effectiveness. Because of the focus on some aspects of cleaning, all of these performance factors are likely to suffer under ENERGY STAR’s proposed standards. Thus, at the efficiency levels and with the cleaning metric and test EPA proposes for Version 7.0 criteria, EPA risks associating the ENERGY STAR brand with poor performing products, despite its intent to do the opposite.
3. **Performance Test is Unreliable:** The ENERGY STAR performance test is not designed to do what EPA is asking of it. It produces highly variable results, which are unreliable for EPA’s intended use. Unreliable test results are harmful to consumers, manufacturers, and the ENERGY STAR program.

AHAM has submitted detailed comments on all three of these issues, and we incorporate those comments here by reference. Our most recent comments are attached at Exhibit A. Rather than repeat our comments on the first two drafts of the Version 7.0 specification, we take this opportunity to highlight key points and supplement our prior comments in hopes that EPA will review our feedback with a fresh perspective and not finalize Version 7.0 as proposed.

The key points AHAM wishes to highlight are:

1. **Because the ENERGY STAR performance test focuses only on one aspect of performance and ignores others, it will likely drive designs that frustrate consumers and could drive them away from the ENERGY STAR program or dishwasher use.**

The dishwasher is a holistic system. Focusing on one aspect of performance—cleaning—may have a ripple effect to the detriment of other performance features consumers value such as drying effectiveness, cycle length, and noise. In order to design dishwashers that meet EPA’s proposed stringent energy and water criteria and its proposed cleaning performance criteria, it is likely that manufacturers will need to reduce drying energy and lengthen cycles. This

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<sup>1</sup> This analysis comes from the Department of Energy’s Technical Support Document: Energy Efficiency Program For Consumer Products And Commercial And Industrial Equipment: Dishwashers January 2022, available at <https://www.govinfo.gov/content/pkg/FR-2022-01-24/pdf/2022-01157.pdf>, as published in 87 Fed. Reg. 3450 (Jan. 24, 2022). The cost increase and energy savings information can be found at Table 8.5.1.

could result in fewer dry dishes and/or cycles that take longer to complete. Noise levels could also be impacted.

Moreover, the ENERGY STAR cleaning test focuses only on one aspect of cleaning—whether or not the soils are removed from the dish and not redeposited back on. It does not address greasy or detergent build-up over time, which consumers will notice as they use the dishwasher. This is a significant issue because when consumers pre-rinse—and most do—the detergent has less to attach itself to and, as a result, there is more soil left on the dishes when the cycle ends. Moreover, if consumers are not satisfied with their dishwasher’s performance, they are not likely to use it, which will result in increased water and energy usage through handwashing, thus undercutting EPA’s energy and water savings goals.

Importantly, EPA has no data to indicate whether the performance criteria it has selected are consumer relevant—will consumers accept performance at the selected level and not at levels below that? Do the test results correlate to performance in the field? EPA has not studied either of these issues. But it has been presented with data that its proposed criteria are not consumer relevant and, to date, has ignored that data and information.

AHAM strongly agrees that performance needs to be maintained for the consumer. We have been advocating for maintaining dishwasher performance as energy and water criteria (through the ENERGY STAR program and the Appliance Standards Program) have become more stringent. But the test EPA proposes was not developed for that purpose and will not accomplish that goal. In fact, it may drive the opposite result by forcing manufacturers to focus on only one aspect of cleaning performance at the detriment of other important performance functionalities.

**2. The ENERGY STAR dishwasher performance test is highly variable, resulting in scores that are essentially meaningless and do not actually ensure dishwashers perform well.**

The ENERGY STAR performance test is also limited in that it is highly variable—it does not produce consistent or reliable results. In 2013, AHAM conducted a round robin test (testing the same product at different labs for comparison) to evaluate the ENERGY STAR performance test. We tested two units at six labs, two of which were third-party labs. The test was conducted twice on each unit in each laboratory by two technicians (graders) at each lab. There was also an observer(s) at each lab. AHAM provided the raw data from this testing to EPA in December 2013 and, in fact, has been commenting since at least 2012 that the ENERGY STAR performance test is not acceptable for establishing cleaning criteria due to its variation.<sup>2</sup> The standard deviations from lab-to-lab varied widely. For a soil-sensing unit,

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<sup>2</sup> AHAM has commented numerous times on the unacceptable variation in the ENERGY STAR Performance Test Method. *See, e.g.*, AHAM Comments on ENERGY STAR Draft 2 Test Method for Determining Residential Dishwasher Cleaning Performance, at 7 (“As AHAM previously commented, and DOE recognizes, the cleanability test procedure must be repeatable and reproducible, especially with increasing enforcement and verification testing. . . . The raw cleaning performance test data DOE provided with Draft 1 of the Draft Procedure show significant variation.”) (Nov. 9, 2012); AHAM Comments on ENERGY STAR Draft Final Test Method for Determining Residential Dishwasher Cleaning Performance, at 3-4 (commenting that DOE should suggest that one grader perform scoring in a

the standard deviation was as high as 6.8%. ***That means, if a unit achieved an average cleaning score of 65 (EPA’s proposed threshold), accounting for variation, the score could actually be anywhere from 58.2 (fail)-71.8 (pass). Even a unit that receives a cleaning score of 70 (higher than the proposed minimum of 65), could pass or fail with a range of possible scores from 63.2 (fail) – 76.8 (pass).***

Thus, whether a unit passes or fails EPA’s proposed criteria depends significantly on who is doing the grading, maybe even more so than on the actual performance of the unit itself. Nothing in this cleaning performance test has changed that would improve variation. AHAM worked for several years to improve the test’s variation without success. Despite many changes designed to improve repeatability and reproducibility, the variation remained consistent. This is likely because the test relies on a human in a lab counting specks on plates—the scoring is inherently subjective.

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given facility and stating that AHAM is “disappointed that DOE, based only on about 250 tests on 12 units, refuses to acknowledge what industry is collectively telling it based on running these tests *every day for more than a decade*. Accordingly, we must re-emphasize that it is critically important that the graders and the facility are consistent and that graders are trained and experienced in order to minimize variation in the test procedure. Introducing multiple graders introduces variation, especially if those graders have varying degrees of knowledge about the test. . . . We do not see any reason why DOE should not want to do what it can to reduce variation.”) (emphasis in original) (March 14, 2013); AHAM Comments on ENERGY STAR Program Requirements: Product Specification for Residential Dishwashers, Eligibility Criteria, Draft 1, Version 6.0, at 4 (“The scoring results, using the AHAM scoring method, from the round robin AHAM conducted showed a[n average] range of two standard deviations . . . It will be difficult to accurately or confidently compare data across manufacturers given the concerns we have raised about reproducibility. . . .[performance] data should not be posted on the ENERGY STAR qualified products list. Given the inherent variation in the data, it would be confusing and potentially misleading to provide it to consumers.”) (March 31, 2013); AHAM Comments on ENERGY STAR Program Requirements: Product Specification for Residential Dishwashers, Eligibility Criteria, Draft 2, Version 6.0, at 2 (reiterating comments on Draft 1) (July 22, 2014); AHAM Comments on ENERGY STAR Most Efficient 2015 Proposed Recognition Criteria, at 3 (“AHAM has commented numerous times (with supporting data from our round robin testing) that the ENERGY STAR Test Method for Determining Residential Dishwasher Cleaning Performance is not sufficiently repeatable or reproducible. And both DOE and EPA have recognized that laboratories need further experience with the test procedure.”) (Sept. 11, 2014); AHAM Comments on ENERGY STAR Proposed Recognition Criteria for Most Efficient 2020 (“AHAM continues to oppose EPA’s proposed performance criteria and reporting for . . . dishwashers in the Most Efficient program. EPA has determined that the test[] that [is] the basis for these criteria [is] not repeatable and reproducible enough for use in the underlying specification. Yet, EPA uses them for Most Efficient. It should not continue to do so.”) (Sept. 9, 2019); AHAM Comments on ENERGY STAR Program Requirements, Product Specification for Residential Dishwashers, Eligibility Criteria, Draft 1, Version 7.0 (“The ENERGY STAR performance test procedure continues to be too variable to be used for mandatory eligibility criteria. . . . The actual score could be anywhere in the range the standard deviation encompasses meaning that it is possible that . . . if a different laboratory conducted the testing, the model might not be eligible. Similarly, a score . . . could actually meet the criteria if tested by another laboratory, but the model would nevertheless be ineligible for ENERGY STAR.”) (May 18, 2020); AHAM Comments on ENERGY STAR Proposed Recognition Criteria for Most Efficient for Dishwashers 2021 (“EPA has determined that the test that is the basis for these criteria [is] not repeatable and reproducible enough for use in the underlying specification, yet EPA uses them for Most Efficient. EPA should not continue to do so.”) (Jan. 21, 2021).

AHAM is not aware of data to show that repeatability and reproducibility concerns have been addressed. Neither EPA nor DOE have conducted a subsequent round robin test or any other test to assess variation. And, though EPA collects data on performance scores, that data does not include data that can help EPA or DOE—or commenters—assess the test’s variability. To the contrary, as we previously commented, AHAM’s test results from attempts to improve the clarity of the test show that the variation concerns remain.

The variation in the test will also make verification of cleaning scores virtually impossible (if EPA is even planning to verify cleaning scores—EPA has not made its intent clear on this point). Because the test is not repeatable or reproducible, it will be highly likely that there will be false findings of both compliance and non-compliance with EPA’s proposed cleaning criteria.

**3. Department of Energy data show that dishwashers meeting EPA’s proposed levels will cost consumers significantly more than those on the market today—costs which will not be recouped through energy and water savings during the product’s lifetime and will price-out low-income consumers.**

DOE’s analysis of the costs and benefits associated with various efficiency levels shows that a dishwasher meeting EPA’s proposed criteria will likely cost consumers \$82 more than a dishwasher meeting the current criteria. And, when compared to the lowest cost dishwashers, which low-income people are most likely to purchase today, a dishwasher meeting EPA’s proposed criteria would cost *over* \$100 more, which clearly shows that lower income people will be disproportionately impacted by the change in criteria, especially if the market responds to the new criteria as it has in the past—by moving most products to ENERGY STAR levels because of pressure from retailers to do so. Yet, consumers will save only three dollars per year in energy costs

**These costs will not be recouped through energy and water savings.** DOE’s analysis shows that consumers will not recover the additional cost of a product at EPA’s proposed levels over the lifetime of the dishwasher. Even if those additional costs could be recovered through savings in the energy and water bills, low-income consumers cannot pay the additional upfront costs of a more efficient dishwasher and assume they will recoup that money over time on their energy or water bill. Instead, they will either purchase used (less-efficient) dishwashers or will not purchase one at all, thus handwashing their dishes, which uses more water.

This outcome directly contradicts the Administration’s stated goals to:

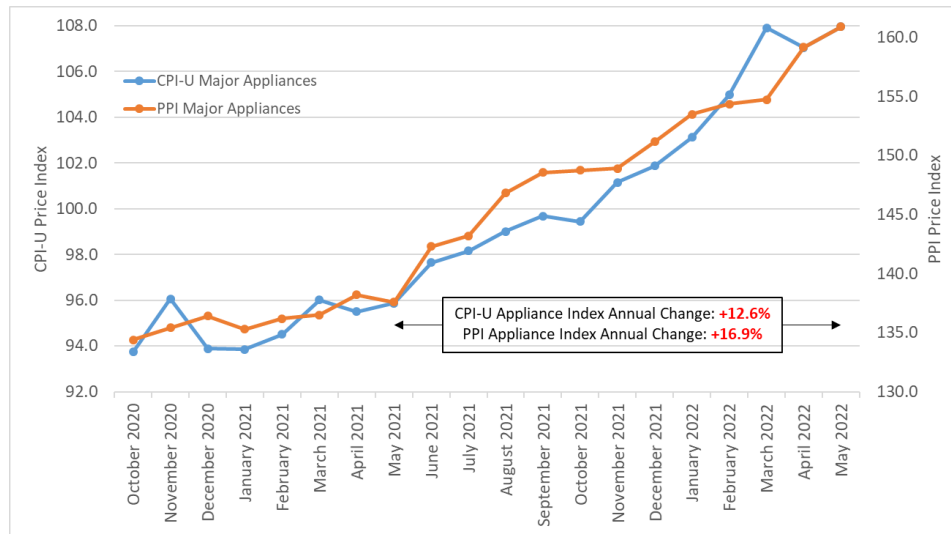
- Deliver environmental justice and ensure agency policies do not continue to promote inequities or serve as barriers to equal opportunity. *See* Executive Order 13985: Advancing Racial Equity and Support for Underserved Communities Through the Federal Government (Jan. 20, 2021).
- Deliver savings on consumers’ energy bills. *See, e.g.*, the Administration’s goals to complete 100 energy-efficiency actions in 2022 to save the average family \$100 a year.

Low-income families often have a higher energy burden—they spend a higher percentage of their income on energy costs. With respect to the equity concerns AHAM and other stakeholders raised, EPA stated that it believes that costs will come down and that closing the cost gap for low-income consumers remains an Agency priority. AHAM questions the basis for this claim. If EPA truly wants to close the gap for low-income consumers, it should work to ensure those consumers have access to efficient dishwashers.

While, as a matter of law, not all dishwashers must meet ENERGY STAR criteria (and indeed the ENERGY STAR program’s goal is not that products are re-designed to meet its criteria, but, instead to recognize top performers), *EPA must recognize that the program’s intent is not consistent with the market realities*. To date, EPA has ignored the fact that ENERGY STAR qualification is essentially mandatory in the market. In its response to AHAM’s comments on Draft 2 of Version 7.0, EPA stated, “ENERGY STAR levels are designed to recognize top performers currently on the market, the costs associated with redesign are not relevant.” But those costs are indeed relevant—in reality, retailers often require that most or all models meet ENERGY STAR criteria and, thus, manufacturers could be forced to redesign products to meet these criteria. It could, thus be the case that more of the market than EPA intends will shift to Version 7.0 criteria, potentially reducing the availability of lower-priced products. EPA must consider this reality in its analysis rather than ignore it because it is not consistent with the program’s intent. Instead of perpetuating historic inequities, EPA should support policies that promote environmental justice.

- 4. This additional cost will come at a time when consumers can least afford it and will compound the pressure consumers are already feeling from inflation.** Inflation is affecting consumers as they pay more at the pump and the grocery store—home appliances are no exception. According to Bureau of Labor Statistics data, the appliance all urban consumers price index (CPI-U) increased by 12.6 percent in May 2022 over the last 12 months. This increase is higher than the all-items CPI-U, which increased by 8.6 percent over the same period. The producer price index (PPI) for appliances increased by 16.9 percent in May 2022 over the last 12 months, compared to total PPI, which increased by 10.8 over the same period. And AHAM data show that industry average per-unit dollar value for dishwashers has increased by about nine percent over the past year.





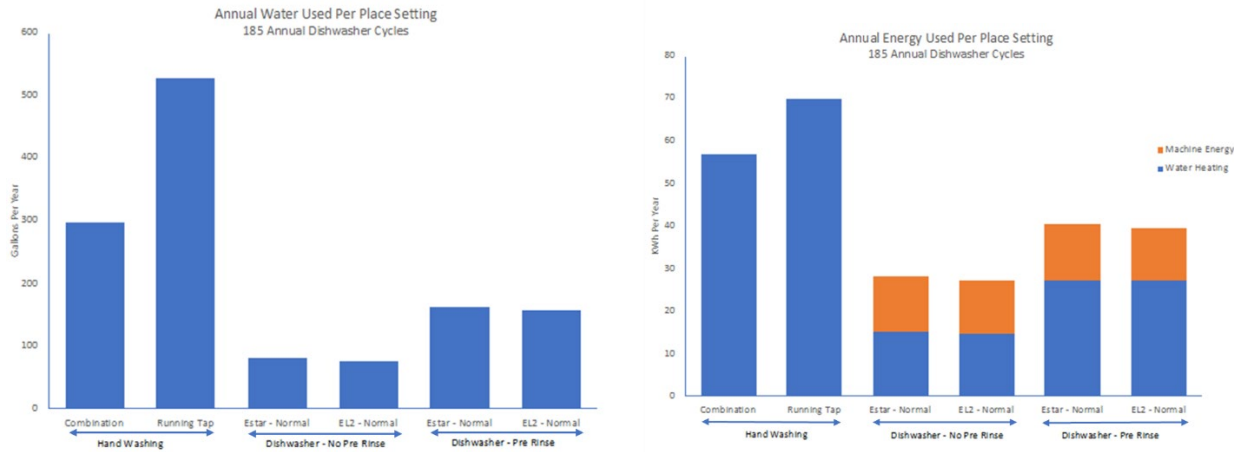
Thus, continuing forward with the proposed changes to the dishwasher ENERGY STAR specification—which will increase costs on top of the already increasing costs due to inflation—is contrary to the Administration’s top economic priority of fighting inflation. In fact, EPA’s proposal will add to rising costs.

**There is a better solution to saving water and energy attributable to the dishwashing process.**

As we have commented on in detail in response to EPA’s prior Version 7.0 drafts, EPA can avoid harming consumers, manufacturers, and the ENERGY STAR program by claiming success for the time-being; focusing on increasing penetration of dishwashers in U.S. homes—especially for low-income consumers; and educating dishwasher users on the significant water and energy savings benefits associated with reducing or eliminating handwashing and pre-rinsing. We do not repeat these benefits here, but highlight the below key points and reference our prior comments for detail.

Low-income consumers would benefit the most from this approach because dishwasher ownership and use appears to be correlated to income level—significantly fewer low-income consumers own and use their dishwashers than the national average.<sup>3</sup> Water and energy use are significantly higher when dishes are washed by hand than when they are washed using one of today’s efficient dishwashers. Water use attributable to handwashing is upwards of 500 gallons per year as compared to below 200 gallons per year when dishes are washed with a dishwasher, even assuming pre-rinsing (and less than 100 gallons/year without pre-rinsing). Energy use follows the same pattern.

<sup>3</sup> According to Federal data (RECS 2015), low-income consumers are far less likely to own a dishwasher (37% own a dishwasher as compared to the national average of 67%). And, even those low-income consumers that own a dishwasher are much less likely to use it than the national average (23% of low-income consumers use their dishwasher as compared to 54% of the national average dishwasher owners).



**A focus on increasing dishwasher ownership and reducing handwashing/pre-rinsing better aligns with the Administration’s goals:**

- It saves significantly more energy and water, consistent with the President’s climate objectives;
- It will save low-income consumers more money on their water and energy bills and could be employed in HUD housing, consistent with goals to employ Environmental Justice through the Federal Government; and
- It does not compound inflation.

We note that EPA has argued that it believes it can both finalize the proposed Version 7.0 specification *and* encourage increased penetration and optimal use of dishwashers. AHAM is skeptical that both can be done *successfully* in tandem. As we have discussed above, if EPA proceeds with its proposed Version 7.0 energy, water, and performance criteria, it will make it more difficult to increase dishwasher ownership and optimal use of dishwashers. First, EPA’s proposal—according to DOE’s analysis—will discourage or prevent people (especially low-income people) from purchasing dishwashers. Second, even for those that purchase them, they may be less likely to use the dishwasher and could turn toward behaviors that undermine energy and water savings goals. AHAM urges EPA to reevaluate its assumption that the dishwasher specification must be continually revised, recognize the success the program has achieved together with its partners, and take a new approach to driving increased water and energy savings.

AHAM appreciates the opportunity to submit these comments on the ENERGY STAR Product Specification for Residential Dishwashers, Eligibility Criteria, Final Draft, Version 7.0, and would be glad to discuss these matters in more detail should you so request.

(Signature on next page)



Sincerely,

A handwritten signature in cursive script that reads "Jennifer Cleary".

Jennifer Cleary  
Vice President, Regulatory Affairs

AHAM represents more than 150 member companies that manufacture 90% of the major, portable and floor care appliances shipped for sale in the U.S. Home appliances are the heart of the home, and AHAM members provide safe, innovative, sustainable and efficient products that enhance consumers' lives. The home appliance industry is a significant segment of the economy, measured by the contributions of home appliance manufacturers, wholesalers, and retailers to the U.S. economy. In all, the industry drives nearly \$200 billion in economic output throughout the U.S. and manufactures products with a factory shipment value of more than \$50 billion.

# EXHIBIT A



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February 24, 2022

Via E-Mail

Katharine Kaplan  
U.S. Environmental Protection Agency  
ENERGY STAR Appliance Program

appliances@energystar.gov

Re: ENERGY STAR Program Requirements, Product Specification  
for Residential Dishwashers, Eligibility Criteria, Draft 2, Version 7.0

Dear Ms. Kaplan:

The Association of Home Appliance Manufacturers (AHAM), respectfully submits the following comments to the Environmental Protection Agency (EPA) regarding the ENERGY STAR Product Specification for Residential Dishwashers, Eligibility Criteria, Draft 2, Version 7.0.

AHAM represents more than 150 member companies that manufacture 90% of the major, portable and floor care appliances shipped for sale in the U.S. Home appliances are the heart of the home, and AHAM members provide safe, innovative, sustainable and efficient products that enhance consumers' lives. The home appliance industry is a significant segment of the economy, measured by the contributions of home appliance manufacturers, wholesalers, and retailers to the U.S. economy. In all, the industry drives nearly \$200 billion in economic output throughout the U.S. and manufactures products with a factory shipment value of more than \$50 billion.

AHAM supports EPA and the Department of Energy (DOE) in their efforts to provide incentives to manufacturers, retailers, and consumers for energy efficiency improvement, as long as product performance can be maintained for the consumer. **Manufacturers, EPA, and DOE can claim success in helping to drive the development of highly energy and water efficient dishwashers.** That success can be translated into even bigger energy and water savings by getting these incredibly efficient products into consumers' homes and helping consumers save even more energy, water, and utility costs by reducing handwashing and pre-rinsing.

Specifically, AHAM continues to urge EPA and DOE to sunset the dishwasher specification and focus their efforts on leveraging the enormous success the ENERGY STAR program has helped achieve by establishing market penetration targets in an effort to increase dishwasher ownership, and educating consumers on proper dishwasher use to reduce handwashing and pre-rinsing.

As AHAM has commented in the past, for residential dishwashers, the opportunities for additional savings beyond those already achieved are severely diminished as products are nearing maximum energy and water efficiency under available technology. ENERGY STAR specifications with further restriction on energy and water use, such as the one EPA is proposing for Version 7.0, are likely to result in limited energy savings while increasing the costs to both consumers (and disproportionately impacting low-income consumers) and manufacturers and degrading the product's performance that cannot simply be resolved by establishing a cleaning metric. Furthermore, neither EPA nor DOE have demonstrated their proposed approach to include a cleaning metric in the applicable test procedure would ensure consumer satisfaction.

It may be that cost-effective technologies will become available in the future that could justify the reintroduction of the specification itself, but those technologies do not currently exist. Thus, the best way to drive energy and water savings is by focusing not small incremental savings, but rather on the much larger savings that can be achieved through a partnership with AHAM and others. We discuss this in more detail below.

We note that EPA proposed a development cycle for a new specification that includes a final version released sometime during the second quarter of 2022, followed by an effective date in the first quarter of the year 2023. EPA indicated that to meet this timeline, it intends to release subsequent drafts of the specification this spring. In the comments below, AHAM reiterates a number of comments made on Draft 1 of the specification which we continue to believe are relevant. AHAM also raises a number of discrepancies between EPA's analysis and the analysis that DOE presented in its preliminary Technical Support Document for a possible amended dishwasher energy conservation standard (Dishwasher Standards Pre-TSD or Pre-TSD).<sup>4</sup> We are hopeful that EPA will not rush this process and instead will fully consider AHAM's comments and those of other stakeholders as well as the data in the Dishwasher Standards Pre-TSD.

#### **I. EPA Should Fully Consider DOE's Preliminary Technical Support Document Before Finalizing Its ENERGY STAR Specification For Residential Dishwashers.**

EPA published its Product Specification for Residential Dishwashers, Eligibility Criteria, Draft 2, Version 7.0 on January 6, 2022. On January 24, 2022, DOE published its Dishwasher Standards Pre-TSD for possible amended dishwasher energy conservation standards. Given that there is little substantive change between Draft 1 and Draft 2 of the Version 7.0 specification, it appeared as though EPA did not consider the data presented in DOE's Pre-TSD as part of its analysis for Draft 2. AHAM sought confirmation from EPA that DOE's Pre-TSD did not affect EPA's analysis during a webinar that EPA held on February 16, 2022. EPA provided verbal confirmation that it did not incorporate information from the Dishwasher Standards Pre-TSD into the analysis for Draft 2. This is concerning because the two agencies are supposed to be working together to administer the ENERGY STAR program and DOE's pre-TSD directly contradicts EPA's analysis for Draft 2.

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<sup>4</sup> See Energy Conservation Program: Energy Conservation Standards for Dishwashers, Webinar and Availability of the Preliminary Technical Support Document; Notification of a webinar and availability of preliminary technical support document, 87 Fed. Reg. 3450 (Jan. 24, 2022).

DOE's standard practice is to evaluate a number of possible efficiency levels (ELs) to assess the impact of standards on the market, consumers, manufacturers, and overall energy savings. The proposed efficiency level in EPA's Draft 2 is the equivalent of EL 3 in DOE's analysis. DOE uses its current energy conservation standard as a baseline (EL 0); EL 1 is a level equivalent to Version 6.0 of ENERGY STAR's dishwasher specification; and EL 2 is a gap-fill efficiency level that is between Version 6.0 and EPA's proposed Version 7.0 levels. Examining the pre-TSD shows that the EPA's justification for its proposed criteria for Version 7.0 are not accurate.

As AHAM has commented numerous times, EPA must ensure the ENERGY STAR program is based upon the foundation DOE lays in the appliance standards program. DOE conducts lengthy, thorough, and transparent rulemakings to determine whether amended standards are justified. EPA should not conduct an analysis separate from DOE's rulemaking process, which has already gone through a rigorous and transparent analysis. Additionally, EPA should not move ahead with using a DOE test procedure that is only proposed, but not yet finalized. That procedure must go through the notice and comment process and may not be finalized as-proposed.

It is especially concerning that EPA does not appear to have coordinated with DOE on its Pre-TSD analysis. It adds significant burden when two agencies (that are supposed to be working together) evaluating energy conservation standards (be they mandatory or "voluntary") for the same products, come out—simultaneously—with two different analyses and expect stakeholders to comment on them at the same time. DOE and EPA should be working closely together and the analysis supporting proposed ENERGY STAR criteria should be based on DOE's more thorough and detailed analysis. Moreover, the timing of the proposals should consider stakeholders' resources and the ability to respond to the proposals. The agencies have failed to coordinate in this matter in virtually all ways.

#### A. DOE Has A More Robust Data Set Than EPA.

EPA's data package, which remains largely unchanged from Draft 1, was first published in 2020. On the other hand, DOE's data is based on information collected over the past year. DOE's data is more current than EPA's and is, therefore, more relevant and appropriate for calculating energy savings and other consumer relevant metrics.

DOE also relies on more thorough data collection methods than EPA. For its Pre-TSD analysis, DOE conducted product teardowns, employed detailed economic and cost models, and provided incremental cost information for technology options.<sup>5</sup> EPA does not employ data collection or analysis as rigorous and should therefore give deference to DOE's data when creating a data package to justify a more stringent ENERGY STAR specification, particularly in this instance where there are notable discrepancies between the two data sets.

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<sup>5</sup> AHAM does not always agree with DOE's conclusions, and often requests more transparency from DOE with respect to its data sets, but the information DOE presents is more detailed than EPA's analysis. EPA should also review comments on DOE's analysis in cases such as this where DOE and EPA are moving in parallel.

EPA should also take into account DOE's proposed test procedure for dishwashers, which reduces the annual number of cycles from 215 to 184 for calculating annual energy use.<sup>6</sup> The lower cycles-per-year estimate is representative of the most updated consumer usage data, and would thus better demonstrate possible life-cycle cost savings for consumers. This decrease in annual cycles has a significant impact on the final energy calculation and EPA should have used this figure while conducting its analysis for a revised ENERGY STAR specification.<sup>7</sup>

The data sets that DOE and EPA are using in their respective analyses are significantly different and it is inappropriate for two different government agencies to effectively regulate the same product using inconsistent data. For the reasons provided above, EPA should reconstruct its analysis using the data DOE published before finalizing Version 7.0 of its dishwasher specification. For the reasons described below, more stringent ENERGY STAR criteria are even less justified if EPA conducts such analysis. An analysis under DOE's data supports AHAM's proposal that EPA and DOE sunset the residential dishwasher ENERGY STAR specification and focus instead on achieving significant savings through increasing dishwasher ownership and proper use of dishwashers.

#### B. EPA Underestimates Incremental Manufacturing Costs

EPA does not currently evaluate the incremental costs manufacturers would incur in reaching the proposed criteria and does not always consider in detail the technology options manufacturers have available to meet the criteria. These analyses, of course, rely on confidential data from manufacturers. DOE's analysis for minimum energy conservation standards is a good starting place and can often provide the analysis necessary. If that data is out of date (indeed, DOE does not include the manufacturer impact analysis in its pre-TSDs), EPA should reach out to manufacturers—its partners in the ENERGY STAR program—to fill any gaps. It is important that EPA consider not only the environmental and consumer benefits associated with a specification change, but also the impact on manufacturers. Although the ENERGY STAR program is technically voluntary, its success essentially mandates it in the market for home appliances. Moreover, manufacturers are EPA's partners in the program—without manufacturer innovation, the program could not succeed. Thus, the impact on manufacturer partners should be of utmost importance to EPA.

In Table 7 of its data package for the first draft of proposed Version 7.0 eligibility criteria, EPA states that the average purchase cost increase for standard dishwashers is about \$48, comparing its proposed efficiency levels to the current DOE minimum standard. With assumed markups, EPA concludes that the incremental manufacturing cost is roughly one-third of that, or in the \$15 to \$20 range.

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<sup>6</sup> See Energy Conservation Program: Test Procedure for Dishwashers; Notice of proposed rulemaking and request for comment, 86 Fed. Reg. 72738 (Dec. 22, 2021).

<sup>7</sup> There are instances where the lower cycles-per-year estimate may narrow the difference between EPA's calculations and those of DOE, but AHAM does not believe that that narrowing is significant enough to materially change the points raised or the oversight in EPA's analysis.



DOE's data tells an entirely different story for standard dishwashers. In Table ES.3.3.4 of its pre-TSD, DOE estimates incremental manufacturing costs of approximately \$71 when comparing EL 3 (the proposed ENERGY STAR Version 7.0 level) to the current DOE minimum standard, and over \$50 when comparing EL 3 to EL 1 (current energy star Version 6.0 level).

EPA should explain this inconsistency, and it should simply use DOE's figures in its calculations. Not only does DOE's data appear to be more accurate, but its estimation of incremental manufacturing costs is far more thorough than EPA's method of using an estimated retail price difference for two models that may or may not have similar cost structures, as AHAM has commented in the past. Moreover, it does not make sense for two agencies regulating the same thing (energy and water efficiency) for the same product (dishwashers) to use two different data sets and, potentially, reach two different conclusions.

#### C. EPA's Analysis Of Technology Options Is Incomplete.

In its analysis on a proposed revised dishwasher specification, EPA states dishwasher technology has made numerous advancements that increase energy and water efficiency. Some of the technologies that EPA believes improve washing and efficiency include in-sump heaters, variable-speed motors, new spray-arm geometry, and flow through heating. EPA further states that advancements in drying technology seen on the market include automatic door releases, fan drying, and desiccant drying among others. EPA believes additional improvements in water use have been delivered through better food filters and soil-sensing controls.

Evaluating data AHAM collected to respond to DOE's request for information (RFI) on energy conservation standards rulemaking in 2020, up to 86 percent of dishwasher models are using at least some of the technology options EPA and DOE identified could be used to meet the proposed Version 7.0 levels to meet today's less stringent levels. Thus, they may not be available for use to meet more stringent ENERGY STAR qualification criteria. This supports AHAM's proposal that EPA and DOE sunset the residential dishwasher ENERGY STAR specification until such time as cost-effective technologies are available to further improve energy and water efficiency without negatively impacting performance, including cleaning performance, cycle length, drying performance, and noise level.

#### D. EPA Overestimates Energy Savings And Underestimates Payback Period.

In evaluating consumer and energy savings, EPA compares proposed revised specification levels to Federal energy conservation standards. EPA should instead be comparing its proposed revised levels to the existing ENERGY STAR levels as opposed to a scenario under which EPA did not institute new levels. EPA should evaluate whether these savings justify *revised* levels, particularly when compared to manufacturer cost and burden. This is not to say that EPA should not also look at the savings comparing a revised level to the Federal minimum when stating ENERGY STAR's benefits. However, that is not the proper comparison for deciding whether it is appropriate to revise an ENERGY STAR level. This is especially the case for dishwashers given that almost all dishwashers currently meet the ENERGY STAR Version 6.0 criteria. Under those circumstances, claiming energy and water savings as compared to products at the standard

level artificially inflates the potential savings and does not accurately reflect the real-world impact such a change would provide.

In Table 2 of its data package for the first draft of the dishwasher specification, Version 7.0, EPA provides an estimate of 67 kWh/year in per-unit energy savings. That figure itself is misleading, given that it is a comparison with the current minimum DOE standard and not a comparison with the version 6.0 ENERGY STAR level (EL 1 in DOE's pre-TSD), where most dishwashers on the market are certified.<sup>8</sup> Given that EPA admitted that it did not consider information in the recent DOE rulemaking, we are assuming that this figure is based on 215 cycles per year, and not the 184 cycles per year that DOE is proposing. If that is the case, EPA's estimate of 67 kWh/year savings is even more inflated. EPA's overestimation is all the more apparent given DOE's pre-TSD analysis. DOE's estimates based on 184 cycles per year are 55 kWh/year when going from Baseline to EL 3 and, more accurately, 25 kWh/year when going from EL 1 to EL 3.<sup>9</sup>

Additionally, EPA's methodology for evaluating consumer payback is seriously flawed and needs to be not only changed, but done uniformly. Currently, EPA selects models it believes are similar but for efficiency and calculates a retail price differential between them. The theory is that by selecting models with similar features, EPA can isolate the cost of improved efficiency. In many instances, EPA has selected only one set of models for comparison.

EPA's approach is flawed in part because it does not take into account that different manufacturers have different cost structures. Thus, EPA could be comparing apples to oranges. Moreover, EPA often relies upon a single data point or only a couple of data points that may or may not be representative. If EPA continues with this flawed methodology (which it need not do because DOE's analysis is more accurate and more recent), it should at least know the shipments associated with the model pairings it selects so it can identify whether the models are representative of the market.

EPA calculates a payback period of 3.7 years, going from the current DOE minimum standard to the proposed Version 7.0 specification level.<sup>10</sup> By comparison, DOE's payback estimate is 12.9 years when comparing the same level.<sup>11</sup> Notably, the assumed lifespan of a dishwasher is 12 years in EPA's analysis, meaning it would take longer than the lifetime of the product for a consumer to recoup the additional cost of the product through energy savings on an electric bill. This is contrary to the ENERGY STAR Products Program Strategic Vision and Guiding

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<sup>8</sup> EPA should recalculate its estimates in a consistent manner. EPA should not choose to do some of its calculations comparing the current DOE standard to Version 7.0 levels, and others comparing Version 6.0 to Version 7. EPA should recalculate using Version 6.0 as a baseline.

<sup>9</sup> See Table 7.2.3 of DOE's pre-TSD.

<sup>10</sup> Table 7 of ENERGY STAR Draft 1 Version 7.0 Residential Dishwasher Data & Analysis Package – Rev. May 2020.

<sup>11</sup> See Table 8.5.1 of DOE's pre-TSD. This is an example where EPA's use of 215 cycles-per-year could decrease DOE's estimate, which is based on 184 cycles, by a year or two. Regardless, EPA should explain the significant difference between its payback analysis and DOE's.

Principles (Guiding Principles) which states a target payback period of between two and five years and also means that EPA is inflating energy savings estimates by nearly 270 percent and payback estimates by nearly 350 percent when compared to DOE's analysis. Again, it does not make sense for two agencies that are supposed to be working together to use different data and reach different conclusions on the same topic. Furthermore, should DOE's payback estimate prove to be more accurate in the field, EPA risks eroding consumer trust in the ENERGY STAR brand. If consumers don't get a payback period within the life of the product, they may come to distrust the label itself.

DOE's data estimates a payback period of seven years when going from EL 1 (current ENERGY STAR, Version 6.0) to EL 3 (proposed Version 7.0), which is also significantly longer than EPA's estimate. Thus, EPA's proposal to change its criteria in Version 7.0 to levels equivalent to DOE's EL 3 will result in a longer payback period than EPA's target payback period of two to five years in its Guiding Principles.

#### E. EPA Should Use Shipments, Not Model Counts.

EPA typically evaluates the number of models that would meet proposed levels rather than looking at the shipments those models represent. This approach is flawed because simply counting models can miss the penetration of those models in the market. It could be that the models meeting the proposed levels are low volume models and, thus, those models may not be representative of the market. And, if the models meeting the proposed criteria are relatively unavailable, that could mean the proposed levels will not actually achieve the consumer and environmental benefits EPA estimates in its analysis. Instead, EPA should use shipments to evaluate the products that would meet proposed levels.

#### F. EPA's Overestimates Life Cycle Cost Savings

EPA estimates an annual operational cost savings of \$16 per year for a standard dishwasher, leading to a \$190 operational cost savings over an assumed 12-year product lifespan.<sup>12</sup> EPA also estimates that the purchase cost of a standard dishwasher at the proposed Version 7.0 level will increase by approximately \$48,<sup>13</sup> creating a net savings of approximately \$142 over the lifetime of the product.<sup>14</sup>

DOE's analysis tells a wildly different story. Comparing EL 3 (proposed ENERGY STAR 7.0 level) to EL 1 (current ENERGY STAR 6.0 level), DOE estimates an average life cycle cost

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<sup>12</sup> Table 2 and 3 of ENERGY STAR Draft 1 Version 7.0 Residential Dishwasher Data & Analysis Package – Rev. May 2020.

<sup>13</sup> Table 7 of ENERGY STAR Draft 1 Version 7.0 Residential Dishwasher Data & Analysis Package – Rev. May 2020.

<sup>14</sup> Again, EPA uses the questionable method of comparison to the current DOE minimum energy conservation standard rather than the version 6.0 specification, which means the savings would likely decrease.

savings of **negative \$35**. That is, there would be a net cost to consumers for purchasing the more energy and water efficient machine, and a staggering approximately 77 percent of consumers would experience that cost.<sup>15</sup>

As DOE and EPA pursue increasingly stringent standards, they should be aware that in instances where consumers bear a cost, that burden will likely fall on low income consumers who do not have much in the way of liquid capital. Those consumers cannot afford to pay the increased cost for a dishwasher. The result will likely be that these households will, instead, forego what is seen as a discretionary purchase and, instead, hand wash their dishes. This will result in significantly higher energy and water use—and costs—for these consumers who can least afford it. These consumers could most benefit from an energy efficient dishwasher that can save them energy, water, and money. **There is a real equity concern that both DOE and EPA should consider.**

Increased efficiency standards for dishwashers, whether through ENERGY STAR or mandatory minimum efficiency standards, that lead to generally increased costs will have a disproportionately negative impact on low-income households. As a matter of environmental justice, it is inappropriate to concentrate the negative impacts of energy conservation on these low-income households. Moreover, doing so is inconsistent with Executive Order 13985,<sup>16</sup> which requires agencies to assess whether its programs and policies perpetuate systemic barriers to opportunities and benefits for people in underserved communities such as persons adversely affected by persistent poverty or inequality. This further supports EPA investigating other approaches to achieve energy savings without creating this undue burden.

The shortcomings in EPA's analysis lend even more credence to AHAM's arguments below regarding the future of the ENERGY STAR Specification for Residential Dishwashers.

## **II. EPA Should Sunset the ENERGY STAR Specification for Residential Dishwashers.**

Especially given that the Dishwasher Standards Pre-TSD's analysis does not support EPA's proposal, AHAM re-iterates its proposal that EPA and DOE sunset the ENERGY STAR specification for residential dishwashers. Importantly, we couple this proposal with a suggestion that EPA instead target more significant energy and water savings by leveraging the program's success and increasing ownership and proper use of the incredibly efficient dishwashers available to consumers today.

As discussed above, DOE's pre-TSD demonstrates that additional, cost-effective efficiency gains are not achievable beyond Version 6.0 levels with existing technology and thus, the ENERGY STAR specification for residential dishwashers should be sunset. EPA's data analysis is fundamentally flawed in several areas and DOE's more accurate analysis demonstrates that it is appropriate to sunset the ENERGY STAR specification for residential dishwashers. In addition to this, as AHAM has previously demonstrated, there are cleaning performance concerns at levels beyond the current ENERGY STAR Version 6.0 levels. Additionally, at levels beyond

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<sup>15</sup> Table 8.5.2 of DOE's Pre-TSD.

<sup>16</sup> Executive Order 13985, "Advancing Racial Equity and Support for Underserved Communities Through the Federal Government" (Jan. 20, 2021).

ENERGY STAR Version 6.0 levels, there would likely also be performance impacts beyond cleaning performance, such as increases in cycle time, decreases in drying performance, and increases in noise level. Cleaning and other performance elements are of critical importance, but neither EPA's previous use of a cleaning performance threshold (in the Most Efficient Program) nor EPA's and DOE's proposed cleaning performance metric in the test procedure for residential dishwashers will protect this important consumer functionality. A better approach would be for each potential standards or ENERGY STAR proposal to evaluate the potential impact of increasing stringency of the applicable level on a holistic set of dishwasher performance elements.

### **III. EPA Should Work to Increase Dishwasher Ownership and Proper Use.**

AHAM requests that EPA partner with key stakeholders to launch and run a campaign that (1) promotes increasing proper consumer usage of dishwashers, and (2) promotes ownership of dishwashers in U.S. homes. Increasing consumer adoption and proper use of dishwashers by even a small percentage of American consumers would save significantly more water and energy than moving from ENERGY STAR Version 6.0 to Version 7.0 Draft 1. Such a campaign could expand and enhance EPA's current messaging on best practices for dishwasher use. EPA already suggests that consumers take advantage of its best practices to save money on utility bills.<sup>17</sup> One of EPA's recommendations for dishwashers is "scrape don't rinse." According to EPA, rinsing dishes can use up to 20 gallons of water before the dishes are loaded in the dishwasher. EPA states, "ENERGY STAR qualified dishwashers and today's detergents are designed to do the cleaning so you don't have to." EPA even suggests that consumers use their dishwasher's rinse feature for dishes that sit overnight instead of hand rinsing.

AHAM agrees that pre-rinsing should be avoided and that today's dishwashers are designed to effectively clean and rinse the dishes without the need for pre-rinsing. It is well understood that consumers still pre-rinse and/or hand wash dishes instead of using their highly efficient dishwasher and that pre-rinsing and handwashing use significantly more water than today's dishwashers. As such, there are significant water (and energy) savings to gain by educating consumers to use their dishwashers more often and to use the correct cycle to clean the dishes. There are other recommendations that EPA should make to consumers to further reduce water and energy use and AHAM would be glad to work together with EPA and other stakeholders on those messages.

Additionally, according to RECS 2015 data, only about 67 percent of U.S. households have a dishwasher. This penetration decreases even further when examining households by gross income level, showing a significant opportunity for energy, water, and cost savings for those consumers.

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<sup>17</sup> [https://www.energystar.gov/products/appliances/dishwashers/best\\_practices](https://www.energystar.gov/products/appliances/dishwashers/best_practices)

<b>Dishwasher Ownership</b>	<b>Less than \$20K Gross Household Income</b>	<b>\$20K – \$39K Gross Household Income</b>	<b>National Average</b>
Owns a dishwasher	37.1%	58.8%	67.3%
Owns and uses their dishwasher	23.1%	41.2%	53.9%
Annual Cycles	106	118	185

This is also supported by AHAM’s 2015 consumer research, which shows that 64 percent of U.S. households own a dishwasher. Dishwashers clean dishes using much less water than hand washing. Thus, promoting dishwasher ownership and the associated significant savings in owning and properly using a dishwasher would result in additional significant energy and water savings. Additionally, such an effort would positively impact low-income consumers who, today, are far less-likely than the national average to own (or even when they own one, to use) a dishwasher and, therefore, would benefit from the significant cost savings associated with lower utility bills should they be able to purchase one of today’s efficient dishwashers.

AHAM believes several stakeholders would have interest in supporting such a campaign. This includes AHAM members and, possibly, detergent manufacturers, and consumer advocacy groups. This type of education campaign could be pursued whether or not EPA decides to sunset the ENERGY STAR specification for dishwashers. We expect to provide more detail on the benefits associated with this approach in the coming weeks and would very much like to discuss it further with EPA and DOE. This approach could go a long way toward meeting the President’s climate goals.

#### **IV. EPA Is Proposing To Include DOE’s Newly Proposed Test Procedure, Which Is Not Supported By Data And Is Fraught With Technical Challenges And Uncertainty**

AHAM is submitting extensive comments to DOE in order to highlight technical challenges and shortcomings with respect to its proposal to include a cleaning performance metric in its energy test procedure, which EPA aims to adopt in Version 7.0. The test is based on the ENERGY STAR’s cleaning performance test and the scoring system from AHAM DW-2-2020 (“DW-2”) “Household Electric Dishwashers.” What follows is a summary of AHAM’s comments to DOE, and we have submitted a copy of those comments to EPA.

Although AHAM agrees that performance is a key consideration for consumers and that it must be protected as energy conservation standards and ENERGY STAR criteria become more stringent, DOE has failed to demonstrate that its proposed approach will do so. DOE has not presented any data to demonstrate that its proposed test and/or threshold are relevant to consumers.

To be consumer relevant, several elements of performance must be evaluated, and DOE’s currently proposed cleaning performance threshold addresses only one of them: cleaning performance. The dishwasher is a holistic system—changes in one area impact other areas. The washing process, and ultimately wash performance, is a function of washing temperatures, length



of washing cycles, types and amounts of detergent applied, and mechanics (power). These four factors all impact each other. Decreasing one factor, like energy or water, means that the other factors, such as time, need to increase. Thus, in order to reduce energy and water use and maintain cleaning performance, it is likely that cycle time could reach a level unacceptable to consumers or that other elements of performance could be impacted.

We also note that DW-2 was designed for companies to use in their product development efforts, not to be used as a regulatory tool. Manufacturers use DW-2 internally, but that use does not require the same precision in repeatability and reproducibility as a mandatory performance threshold does. In addition, actual product performance depends on how a consumer uses the product—how they load it, how much soil is on the dishes, how many dishes are in the dishwasher, the amount and type of detergent used, whether rinse-aid is used, etc.—but, DW-2 was never meant to replicate consumer interaction with the product (it was intended to assess re-deposition), and so these variables are not fully addressed.

DOE has not demonstrated that its proposed cleaning test or its proposed cleaning metric of 65 for cleaning performance correlates to actual consumer satisfaction with dishwasher performance. In fact, DOE has admitted that its proposals are almost entirely unsupported by data during a public meeting held on February 3, 2022. Without data to support its proposal or its assumptions, DOE’s proposal to include a cleaning performance metric as well as its proposal that the threshold for the metric should be 65 is arbitrary and capricious and does not satisfy the requirements of the Data Quality Act.

The performance test continues to be too variable to be used for mandatory criteria. AHAM made this same argument with EPA’s ENERGY STAR program and provided EPA the AHAM round robin testing data to prove that the proposed cleaning performance test simply does not work for the purpose of setting or demonstrating compliance with a minimum performance threshold.

Accordingly, AHAM cannot support DOE’s proposal to include a performance metric in the test procedure without DOE providing data and information to address the significant concerns AHAM raises in its comments and we urge EPA not to adopt this proposed performance metric either.

## **V. EPA Should Not Eliminate The Five Percent Allowance For Connected Products.**

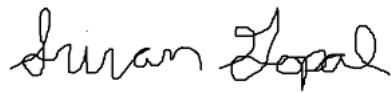
EPA cites “dwindling interest” in demand response programs for household appliances to justify a planned phasing out of the five percent credit for connected appliances and for not providing that credit to dishwashers.

AHAM does not agree that there is dwindling interest in demand response programs. AHAM is engaged with the California Energy Commission and the Consortium for Energy Efficiency, both of whom are developing energy management programs for smart homes. Furthermore, the DOE’s *National Roadmap for Grid-interactive Efficient Buildings* calls for connected appliances to play a role in meeting the Biden Administration’s climate and efficiency goals.

Connected technologies are on the cusp of reaching maturation and the time is ripe for demand response and flexible load capabilities to take hold. One goal of the ENERGY STAR program is to drive innovation. Energy savings from connected appliances could be greater than the savings gained through appliances meeting ENERGY STAR criteria alone, particularly with dishwashers where efficiency gains are limited. This is the wrong time to remove this market incentive and EPA should not signal a loss in value. Therefore, EPA should not eliminate the credit for any appliance category.

AHAM appreciates the opportunity to submit these comments on the ENERGY STAR Product Specification for Residential Dishwashers, Eligibility Criteria, Draft 2, Version 7.0, and would be glad to discuss these matters in more detail should you so request.

Sincerely,

A handwritten signature in black ink that reads "Sriram Gopal". The signature is written in a cursive, flowing style.

Sriram Gopal  
Director, Technology and Environmental Policy